

### Remarks

The Applicants thank the Examiner for indicating allowable subject matter and for withdrawing the restriction requirement.

Claims 9, 30 and 45 were indicated as containing allowable subject matter and are being placed into independent form. Other changes unrelated to patentability have been made to claims 9, 30 and 45 to improve their readability. Therefore claims 9, 30 and 34 should now be allowable.

Claim 33 is being amended to replace the phrase "ion implementation" with - - ion implantation. - -

New independent claims 46, 48, and 50 emphasize that the dissipative material is positioned so that it contacts the device being bonded during normal bonding and explicitly recite that there is a current flow, which is absent from the references relied upon by the Examiner. Claim 50 is a method of use and as such, even were the bonding tip of Applicants' invention disclosed or made obvious by the references, the method of use is not disclosed by any of the references relied upon by the Examiner and is still patentable.

New claims 47, 49 and 51 limit the current flow to no more than 3 milliamps.

### 35 USC §102

#### Elwood et al.

The Examiner rejected claims 1, 3, 10, 19, 24, 32 and 39 under 35 USC §102(b) as being anticipated by Elwood et al.

However, claim 39 depends from claim 37, which was not rejected over Elwood et al. under 35 USC §102(b). Clarification is respectfully requested.

Regarding independent claims 1, 19 and 37, Elwood et al. never discuss the electrical properties of their tip. Further the tip of Elwood et al. has foot 5 and is made for a “polycrystalline diamond material” (column 2, line 49), which is typically an insulator preventing the dissipation of charge. Although shank 3 of Elwood et al. could be made from metallic materials such as tungsten carbide it does not come in contact with the wire being “microwelded,” and therefore does not allow for the dissipation of charge. Further, these metallic materials of shank 3 are conductors, which conduct electricity at a significant rate that would damage sensitive equipment were they to contact the wire. In contrast, claim 1 requires that the tip have a “dissipative material” that dissipates charge at a rate fast enough to avoid the “discharge” of charge, which could damage sensitive equipment, and at a rate slow enough so that the current flow does not damage the equipment. The Osmium or ceramic foot of the prior art is also typically an insulator that does not conduct electricity and prevents the dissipation of charge, in contrast to claims 1, 19 and 37. In particular, column 2, lines 44-58, cited by the Examiner, discuss mechanical properties such as “material ...load up” (column 2, line 52) and not electrical properties; column 3, lines 12-22, cited by the Examiner, discuss the structure illustrated in FIG. 1 and not the electrical properties; and column 1, lines 51-63 discuss mechanical problems found in the prior art and not the electrical properties.

Regarding claim 10, Elwood does not disclose or suggest an *electrically dissipative* ceramic.

The Examiner is reminded that

an examiner carries the initial burden of proof for showing that the prior art structure or step is the same....(MPEP 2182, p. 2100-162, left column, middle paragraph, also see MPEP 2112. See MPEP 2142 regarding the Examiner bearing the initial burden under 35 USC §103).

In other words, the burden of proof is upon the Examiner to prove the claims unpatentable. Thus, the Applicants respectfully submit that it logically follows that the Examiner must prove that Elwood et al. has the electrical properties recited in independent claims 1, 10, 19 and 39, but she has not.

Regarding claim 32, although Elwood et al.'s bonding tip may be machinable Elwood et al. never disclose the use of "machining" for shaping their tool tip and could use sandblasting or chemical etching, for example. Consequently "machining" is not disclosed or inherent. Elwood et al.'s prior art only use machining to correct for deformities that occur during extended use. The correction process lacks the step of forming because the tip was formed and shaped (but not necessarily machined) in a different process when it was initially made.

Matcovich et al.

The Examiner rejected claims 1, 2, 10, 11, 19, 23, 37 and 38 under 35 USC §102(b) as being anticipated by Matcovich et al.

Regarding independent claims 1, 19, and 37, Matcovich et al. state,

It is another object of the present invention to provide a novel heating element which may be applied to electrically conductive bonding tools *without introducing current into the device being bonded* (emphasis added, column 2, lines 35-38)

In other words the tip of Matcovich et al. is constructed in such a fashion as to not introduce a current or dissipate charge. In contrast, independent claims 1, 19, and 37

dissipate charge so as to avoid a damaging sudden discharge of charge. Although the electrical resistance film 23 may conduct a current, it does not contact the device being bonded and therefore cannot dissipate out of the insulative tip the charge that builds up from contact with the device being bonded. Additionally, film 23 is likely to be too conductive and would allow too high of a current to flow, which could damage the device being bonded were it to contact the device being bonded. Similarly, contact pads 22 do not come in contact with the device being bonded to dissipate charge, and clearly conduct electricity at a rate that would damage the device being bonded were they to contact it. Shank 24 has been presumably made to achieve the above-cited objective of Matcovich et al. and therefore does not dissipate charge away from or through the device being bonded, in contrast to claims 1, 19 and 37.

Regarding claim 10, none of the materials used by Matcovich et al. are disclosed to be ceramics and therefore they are not electrically dissipative ceramics. The conductors 22 and 23 conduct electricity too well to be dissipative ceramics and the insulator 24 is does not dissipate charge in accordance with the above-cited objective.

Regarding claims 2, 23, and 38, in addition to the reasons given regarding independent claims 1, 10, 19, and 37, the “resistance” of Matcovich et al. is given in units of ohms per square whereas the resistance of the claims is given in ohms. Specifically, Matcovich et al. state

Ohms per square is herein defined as the resistivity  $\rho$  divided by the thickness  $t$  where the length  $l$  and the width  $w$  of the square area under test are equal (italics added, column 5, lines 3-6).

In other words, what Matcovich et al. call “resistance,”  $r$ , is given by

$$r = \frac{\rho}{t},$$

whereas resistance  $R$  is normally defined as

$$R = \frac{\rho l}{A} = \frac{\rho l}{w^2}.$$

Thus, the conversion factor  $c$  between  $r$  and  $R$ , where  $R = cr$ , is given by

$$c = \frac{R}{r} = \left( \frac{\rho l}{A} \right) / \left( \frac{\rho}{t} \right) = \frac{tl}{w^2}.$$

The Examiner has not shown that the  $c$  or  $tl/w^2$  necessary for converting between Matcovich et al.'s resistance  $r$  and the resistance recited in claims 2, 23, and 38 is within a range such that it falls within the claimed range of  $10^5$  to  $10^{12}$  ohms. In fact film 23 has a resistance of "5 to 20 ohms" (column 4, line 34) or 15 ohms (column 4, line 38), which are well outside of the range of  $10^5$  to  $10^{12}$  ohms specified in claims 2, 23 and 38.

Regarding claim 11, in addition to the reasons given regarding independent claims 1, 10, 19, and 37, although Matcovich et al. may use alumina for their shank,

The preferred embodiment bonding tool is made of dense alumina (over 99% density)... For purposes of this invention the term "high density non-porous alumina" shall mean dense, *pure* alumina having a density greater than 99 percent. Presently, alumina is obtainable in densities about 99.5 percent (emphasis added, column 3, lines 46-56).

In other words, the alumina of Matcovich et al. is essentially pure and not a ceramic.

They do not disclose that the alumina needs to be a ceramic or an electrically dissipative ceramic, as claimed. The word "ceramic" may imply that the alumina has other materials mixed in it, such as non-metallic minerals, or is made in a particular way to give it desired properties associated with a ceramic. In this case it also needs to have dissipative electrical properties to meet the claim limitations.

Hadar et al.

The Examiner rejected claims 1, 4-8, 10, 19, 23, 25-29, 32-34, 37, and 39-44 under 35 USC §102(e) as being anticipated by Hadar et al.

Regarding independent claims 1, 10, 19, and 37, Hadar et al. never discuss the electrical properties of layer 21. Consequently, it is not known whether layer 21 of Hadar et al. has the claimed electrical properties because whether silicon nitride or diamond was used for layer 21 the resistance depends upon how it was made and what additives were added, if any. Further, regarding claims 1, 19, and 37, layer 21 is not grounded and Hadar et al. also does not discuss grounding the device being bonded. Consequently, even if the silicon nitride layer had a resistance appropriate for dissipating charge it could not dissipate the charge in a slow and continuous manner and could therefore damage ElectroStatic Discharge (ESD) sensitive equipment, in contrast to the claims 1, 19, and 37.

Regarding, claims 4-8, 25-29, and 40-44, the Applicants respectfully submit that Hadar et al. column 6, lines 37-43 do not explicitly teach adding dopants to layer 21, but state

*It is known* that dopants and alloy gases can be introduced into chamber 30 to create oxide and nitride layers, *however, it is not obvious* that vapor deposition (sputtering) of diamond and diamond alloys may be created which deposit out on the working faces 21, 28 of the tools *in the manner described hereinbefore* (emphasis added).

In this statement the phrases “It is known,” “however, it is not obvious that,” and “in the manner described hereinbefore,” combine to convey the message that although it was known to do...however it was not obvious to do..., thereby advertising the non-obviousness of the process of Hadar et al. In other words, the first half of the statement

that it is known to use a sputtering system similar to that of Hadar et al. for introducing dopants was only made to better define and place into context Hadar et al.'s contribution to the art of sputtering diamond and diamond alloys. It was not intended to, and does not, teach doping layer 21. Hadar et al. never discuss adding or ion implanting dopants into layer 21. In contrast, claims 4-8, 25-29, and 40-44 all recite the use of dopants or ion implantation.

Claims 5, 26, and 41 recite polycrystalline silicon carbide doped with boron. Even if *arguendo* Hadar et al. column 6, lines 37-43 taught the use of dopants, it clearly does not teach which dopants to use with which material when forming layer 21 and therefore does not teach doping silicon carbide with boron, as claimed. Further, Hadar et al. never explicitly state that the silicon carbide used for layer 21 is polycrystalline in structure in column 5, lines 38-50 or column 5, line 56 through column 6, line 10, cited by the Examiner, or anywhere else.

Regarding claims 7, 28, and 43, it is not clear where Hadar et al. disclose that tip 13 can be made from diamond.

Regarding claim 23, Hadar et al. never disclose the electrical properties of the layer 21 or the blank 13 and therefore do not disclose that the resistance is within the claimed range of  $10^5$  to  $10^{12}$  ohms.

Linn

The Examiner rejected claims 1-4, 10, 19-21, 24, 32, 35, and 37-39 under 35 USC §102(e) as being anticipated by Linn

Regarding independent claims 1, 10, 19, and 37, the resistance of the tip is never discussed in Linn. Alumina or aluminum oxide that is “pure” (column 2, line 60) and “does not contain electrically conductive metallic material” (column 2, lines 58 and 59) is insulative and has too high of a resistance to be considered dissipative, while, regarding independent claims 1, 19, and 37, tungsten carbide tends to have too low of a resistance to avoid damaging the device being bonded.

Regarding claim 10, tungsten carbide, alumina, sapphire, and diamond are typically not electrically dissipative ceramics.

Regarding claims 2 and 38, element 308 has an impedance of 50 ohms (column 5, lines 56-59), which is not within the claimed range of  $10^5$  to  $10^{12}$  ohms. Further, element 308 is not the tip. The word “ohms” does not appear anywhere else in the patent of Linn.

Regarding claim 4 the words “doped,” “dopant,” “ion,” “atom,” and “implant” do not appear in Linn. It is not clear how Linn could disclose the use of dopants as recited in claim 4.

Although Linn may mention sintering, Linn never mentions hot reactive powders, mixing, or molding as recited in claim 20 or hot pressing as recited in claim 21.

Regarding claim 20, Linn uses essentially pure alumina without metallic binders (the first sentence of the Abstract and claim 3 of Linn) and therefore does not need to use any mixing.



Razon et al.

The Examiner rejected claims 1-4, 10, 19, 23, 24, 29, 32, 39, and 40 under 35 USC §102(e) as being anticipated by Razon et al.

Regarding independent claims 1, 10, 19, and 37, the resistance of the tip is never discussed in Razon et al. Alumina and ruby tend to be insulative and have resistances too high to be considered dissipative, while, regarding independent claims 1, 19, and 37, tungsten carbide tends to have too low of a resistance to avoid damaging the device being bonded.

Regarding claim 10, tungsten carbide, alumina, and ruby are typically not dissipative ceramics.

The Examiner rejected dependent claims 39 and 40 without rejecting independent claim 37 from which they depend. Clarification is respectfully requested.

Regarding claims 2 and 23, element 308 has an impedance of 50 ohms (column 5, lines 56-59), which is not within the claimed range of  $10^5$  to  $10^{12}$  ohms, and element 308 is not the tip. The word ohms does not appear anywhere else in the patent of Razon et al.

Regarding claims 4, 29, and 40 the words “doped,” “dopant,” “ion,” “atom,” and “implant” do not appear in Razon et al. It is not clear how Razon et al. could disclose the use of dopants as recited in claims 4, 29, and 40.

Regarding claim 29, Razon et al. never disclose the use of a layered structure and therefore never disclose the use of a doped semiconductor on a conducting core.

35 USC §103

*Elwood et al. in view of Omori et al.*

The Examiner rejected claims 4, 5, 25, 26, 33, 34, 40, and 41 under 35 USC 103(a) as being unpatentable over Elwood et al. in view of Omori et al.

The arguments above regarding independent claims 1, 10, 19 and 37 and Elwood et al. are not cured by Omori et al. and are therefore equally applicable to the present rejection.

The Examiner stated, "Note that the material resistance is  $10^{11}$  ohm-cm (col 11 lines 1-22)." However, column 11, lines 1-22 discusses "specific resistance" (column 11, line 4), which is essentially resistivity, having units of ohm-cms, and does not discuss resistance, having units of ohms.

Although Elwood et al. may mention the use of other materials such as metal carbides and steel alloys they do not mention silicon alloys or semiconductor carbides such as silicon carbide. Thus, the Applicants respectfully submit that contrary to the Examiner's assertions it is not clear whether one of ordinary skill in the art would have recognized silicon carbide as a substitute for Elwood et al.'s tungsten carbide. Consequently, the Applicants respectfully submit that the Examiner's basis for concluding (the middle of page 5 of the Office Action)

It would have been obvious ... to employ the semiconductor material (which would have a resistance in the range 10 to  $10^{12}$ ) to enhance wear and abrasion resistance, while decreasing stress at the tip  
is at best tenuous.

More importantly, Omori et al. state,

Main object of the present invention is to provide composite silicon carbide sintered shapes especially *suitable for substrates* of a high dielectric breakdown strength for electronic circuit having a surface layer abundant in rare earth oxides (sic, emphasis added, column 1, lines 63-67).

Thus, included in the main object of Omori et al. is producing a product that is suitable for substrates for electronic circuits.

Although Hadar et al. and Matcovich et al. were not cited in this rejection, all prior art must be taken into account including teachings that teach away from the invention when determining nonobviousness.

In contrast to Omori et al., Matcovich et al. state,

The preferred embodiment bonding tool is made of dense alumina.... Alumina substrates, used for miniaturized circuits or supports for integrated circuits, have lower density which provides greater porosity than the porosity of bonding tool 10.... High density alumina has a non-porous glass-like surface finish and is easily distinguished from alumina used for substrates and integrated circuits which require porous surfaces to enable the circuit elements to lock into the porous surfaces (column 3, lines 46-61).

Hadar et al. also state

Refer now to FIG. 1 showing a typical prior art capillary bonding tool.... Such tools, made of ceramic material, are used in automatic wire bonders to make gold ball bonds. ... The most common material for such capillary bonding tool is pure alumina which is compacted or pressed into a high density non-porous elongated body that is machined and polished at the working face, chamfer and through-hole to provide a tool having high fracture toughness and long wear (column 2, line 59 through column 3, line 3).

Thus, "substrates [such as those of Omori et al.]... require porous surfaces to enable the circuit elements to lock into the porous surfaces," as taught by Matcovich et al., whereas bonding tool tips require "a high density non-porous elongated body that is machined and polished ... to provide a tool having high fracture toughness and long wear," as taught by Hadar et al. Therefore it would not be obvious to use the boron doped silicon carbide of Omori et al. to replace the tungsten carbide of the bonding tool of Elwood et al. because

it would result in a tool bonding tip that would not even have the “high fracture toughness and long wear” of the prior art bonding tips of Hadar et al. and Matcovich et al. because of its high porosity

Further, such a substitution would not cure the deficiency of Elwood et al.’s diamond foot 5 not dissipating charge and the lack of a ground connection or other means for dissipating a charge built up in the shank.

Matcovich et al. in view of Omori et al.

The Examiner rejected claims 4-8, 20, 21, 26-29, 31, 33-35, and 42-44 under 35 USC 103(a) as being unpatentable over Matcovich et al. in view of Omori et al.

The arguments above regarding independent claims 1, 10, 19 and 37 and Matcovich et al. are not cured by Omori et al. and are therefore equally applicable to the present rejection.

Claim 31 recites a specific seven step process and claim 35 recites a specific four step process. It is not clear where Omori et al. discloses either of these different processes, let alone both.

Further, Omori et al. use sintering to form “composite sintered shapes” (see column 2, line 10, for example), which must later be machined into the desired shape (see for example column 5, lines 17-20). This is extremely inconvenient for forming a film such as “electrical resistive heating *film*” 23 (see the label on FIG. 5 of Matcovich et al.), which is on the surface of a tool. The machining of the sintered composite to form a film on shank 24 of Matcovich et al. is likely to damage the tool tip and the bond between film 23 and shank 24 would be of at best questionable integrity. Therefore, it would not be

obvious to one of ordinary skill in the art to use the sintered composite shape of Omori et al. to form the film 23 of Matcovich et al. well bonded to shank 24 without damaging the tool tip.

As explained above,  $10^{11}$  ohm-cm of Omori et al. is in different units than the  $10^5$  to  $10^{12}$  ohms of claims 2, 23, and 38. Although the claims 4-8, 20, 21, 26-29, 31, 33-35, and 42-44 under 35 are not limited to the resistance range of  $10^5$  to  $10^{12}$  ohms, assuming *arguendo* that  $10^{11}$  ohm-cm of Omori et al. is within the  $10^5$  to  $10^{12}$  ohms as alleged by the Examiner, it would not have been obvious to substitute a film that is supposed to have resistance of 5 to 20 ohms (such as film 23 of Matcovich et al.) with one that has a resistance of  $10^5$  to  $10^{12}$  ohms.

Matcovich et al. in view of Chatterjee et al.

The Examiner rejected claims 12-18 under 35 USC 103(a) as being unpatentable over Matcovich et al. in view of Chatterjee et al.

The Examiner stated (the first paragraph of page 7),

It would have been obvious ... to employ dense zirconia and alumina as the *tool* material for reliability and extended life (Matcovich, col 2 lines 17-23) (emphasis added).

The arguments above regarding independent claims 1, 10, 19 and 37 and Matcovich et al. are not cured by Chatterjee et al. and are therefore equally applicable to the present rejection.

As pointed out above the 10 to  $10^6$  ohms per square is not the same as, and therefore not necessarily within, the range of the  $10^5$  to  $10^{12}$  ohms of claim 2, 23, and 38. Although claims 12-18 are not limited to having a resistance of  $10^5$  to  $10^{12}$  ohms, the tool of Matcovich et al. is resistive whereas the zirconia alumina mixture of Chatterjee et al.

is conductive. Therefore, it would not have been obvious to one of ordinary skill in the art to substitute the insulative material forming shank 24 of Matcovich et al. for a conductive material Chatterjee et al., especially in view of Matcovich et al. having an objective of not “introducing current into the device being bonded” (column 2, lines 35-38 of Matcovich et al., cited above).

Hadar et al. in view of Hajaligol et al.

The Examiner rejected claims 22 and 36 under 35 USC 103(a) as being unpatentable over Hadar et al. in view of Hajaligol et al.

The Examiner stated (the second to last paragraph on page 7),

Hajaligol teaches a method of forming carbides, nitrides and borides of titanium, and silicon (col 14 lines 1-30)

However, Hajaligol et al. state,

In order to improve thermal conductivity and/or resistivity of the alloy, particles of electrically conductive and/or electrically insulating metal compounds can be *incorporated* in the alloy. Such metal compounds include oxides, nitrides, silicides, borides and carbides of elements...(column 13, line 65 through column 14, line 2)

The Applicants therefore respectfully submit that the list of elements in column 1, lines 1-30 is not a list of materials made but a list of additives “incorporated in” to the material made by Hajaligol et al., contrary to the implications of the Examiner’s assertions. The objective of Hajaligol et al. is to provide a method in which

iron-aluminide could be prepared by a powder metallurgical technique wherein it is not necessary to can the powder and wherein it is not necessary to subject the iron and aluminum to any hot working steps in order to form an iron-aluminide *sheet* product (emphasis added, column 5, lines 46-50).

However, film 21 of Hadar et al. is “deposited” (column 5, line 40) using a “sputtering chamber” (column 5, line 33), for example, and not applied as sheets. The Examiner has

not provided a reason why one of ordinary skill would have been motivated to use sheets of specifically iron-aluminide for the *film* 21 of Hadar et al. Hadar et al. are trying to achieve a Vickers hardness of 3000 (column 5, lines 37-45 of Hadar et al.) Yet, the iron-aluminide sheets of Hajaligol et al. have a Rockwell C hardness between 35 and 44 (see table 6, column 23, lines 1-10 of Hajaligol et al.) However, a Rockwell C hardness of 45 is equivalent to a Vicker's hardness of only 454 (see table 1, column 3, lines 1-19 of Abbate et al.), which is nearly an order of magnitude less than what Hadar et al. desire. Considering that the purpose of layer 21 of Hadar et al. is "substantially increasing the hardness of the working face of a bonding tool" (column 2, lines 4-6 of Hadar et al.) which already has a Vicker's hardness of 2000 (column 5, lines 46- 51) even without layer 21, it would not have been obvious to use the sheet of Hajaligol et al. because it would have resulted in a far softer working face of the bonding tool (i.e., a working face with a Vicker's hardness of less than 454) than even the prior art working face of Hadar et al.

Should the Examiner insist on equating the resistivity of the cited references, which have units of ohm-cms, with the resistance of the claims, which have units in ohms, the Applicants note that the iron-aluminide sheets of Hajaligol et al. have resistivities of  $149 \times 10^{-6}$  to  $251 \times 10^{-6}$  ohm-cm (table 5, lines 36-54), which following the Examiner's rationale is the same as  $149 \times 10^{-6}$  ohm to  $337 \times 10^{-6}$  ohm and is highly conductive rather than dissipative, in contrast to the claims.

Regarding claim 36, the Applicants respectfully submit that column 15, line 59 through column 16, line 35 of Hajaligol et al. does not disclose the steps of "extruding the rolled ingot," "pressing the drawn material," and "heating the pressed material." Also,

although the word “wrought” appears within the passage cited by the Examiner on line 12 of column 16, it is not clear where the Examiner found a teaching of “drawing the extruded material” as recited in claim 36.

Additionally, sheets are not easily applied as films and may form a bond of questionable integrity with the bonding tool tip.



## Summary

None of the references relied upon by the Examiner disclose a dissipative ceramic or a dissipative bonding tool tip. Allowing a current to flow from the tip to the device being bonded during bonding is counter conventional wisdom because the current could damage the device if it is too high.

Resistivity and specific resistance referred to by the Examiner are not the same as resistance. The units ohm-cms and ohms per square referred to by the Examiner are not the same as the unit ohms.

Elwood et al. never discuss the the electrical properties of their tip. Further the tip of Elwood et al. has foot 5 and is made for a “polycrystalline diamond material” (column2, line 49), which is typically an insulator and would not allow for the dissipation of charge.

The alumina or aluminum oxide of Linn that is “pure” (column 2, line 60) and “does not contain electrically conductive metallic material” (column 2, lines 58 and 59) is insulative and has too high of a resistance to be considered dissipative, while tungsten carbide tends to have too low of a resistance to avoid damaging the device being bonded.

The alumina of Matcovich et al. is essentially pure and they do not disclose that the alumina needs to be a ceramic or an electrically dissipative ceramic, as claimed.

Hadar et al. never discuss the electrical properties of layer 21.

Razon et al. do not teach using a dopant.

Omori et al. is intended to be used for substrates, which are porous, whereas Elwood et al.’s tool tip is supposed to be non-porous. Therefore it would not have been obvious to use Omori et al.’s substrates for Elwood et al.’s tool tip.

It would be difficult to apply Omori et al.'s material as films to the bonding tool tip of Matcovich et al. because Omori et al. uses sintered composite shapes that require machining. The heating resistor of Matcovich et al. has a resistance of only 5 to 20 ohms. Therefore even if *arguendo* Omori et al. did have a resistance of  $10^5$  to  $10^{12}$  ohms as alleged by the Examiner, Omori et al.'s resistance would be too high to use in the combination proposed by the Examiner.

The Applicants respectfully submit that it would not have been obvious to one of ordinary skill in the art to substitute the insulative material forming shank 24 of Matcovich et al. with a conductive material such as that of Chatterjee et al., especially since Matcovich et al. has an objective of not "introducing current into the device being bonded" (column 2, lines 35-38 of Matcovich et al., cited above).

The Applicants respectfully submit that it would not have been obvious to use the sheet of Hajaligol et al. for the film of Hadar et al. because it would have resulted in a far softer working face of the bonding tool (i.e., a working face with a Vicker's hardness of less than 454) than even the prior art working face of Hadar et al., which has a Vicker's hardness of 2000. Additionally, sheets are not easily applied as films.

In the combinations proposed by the Examiner the secondary references destroy critical properties of the primary references such as by using a material that is porous when the primary reference specifies a non-porous material, using a material that is far softer than the one desired in the primary reference, and using sintered composite shapes and sheets of material to replace films that are sputtered. Such combinations are not allowed in a rejection under 35 USC §103 (cf. MPEP 2143.01, p. 2100-99, right column under the heading, "THE PROPOSED MODIFICATION CANNOT CHANGE THE

PRINCIPLE OF OPERATION OF A REFERENCE," which cites *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)).

The Applicants respectfully submit that there are many steps in claims 31, 35 and 36 that are not taught by the reference relied upon by the Examiner.

New independent claims 46, 48, and 50 emphasize that the dissipative material is positioned so that it contacts the device being bonded during normal bonding and explicitly recite that there is a current flow, which is absent from the references relied upon by the Examiner.

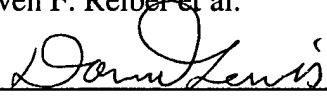
New claims 47, 49 and 51 limit the current flow to no more than 3 milliamps.

Therefore, the Applicants respectfully request reconsideration and allowance of this application. The Examiner is invited to call the undersigned representative for any questions relating to this application.

Respectfully Submitted,  
Steven F. Reiber et al.

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